



Sequence Listing 1998-407-FF-SQ  
SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT:

- (A) NAME: Akzo Nobel N.V.
- (B) STREET: Velperweg 76
- (C) CITY: Arnhem
- (E) COUNTRY: The Netherlands
- (F) POSTAL CODE (ZIP): 6824 BM
- (G) TELEPHONE: 0412 666379
- (H) TELEFAX: 0412 650592

(ii) TITLE OF INVENTION: Coccidiosis vaccines

(iii) NUMBER OF SEQUENCES: 41

(iv) COMPUTER READABLE FORM:

- (A) MEDIUM TYPE: Floppy disk
- (B) COMPUTER: IBM PC compatible
- (C) OPERATING SYSTEM: PC-DOS/MS-DOS
- (D) SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 214 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Met Pro Phe Glu Leu Pro Pro Leu Pro Tyr Pro Met Asp Ala Leu Glu  
1 5 10 15  
Pro Tyr Ile Ser Lys Glu Thr Leu Glu Tyr His Tyr Gly Lys His His  
20 25 30  
Ala Ala Tyr Val Asn Asn Leu Asn Arg Leu Val Glu Gly Lys Pro Glu  
35 40 45  
Ala Ser Lys Ser Leu Glu Glu Ile Ile Lys Thr Ser Ser Gly Ser Val  
50 55 60  
Leu Asn Asn Ala Gly Gln Ala Trp Asn His Thr Phe Tyr Trp Lys Ser  
65 70 75 80  
Met Arg Pro Ala Ser Ala Gly Gly Pro Pro Gly Ala Pro Gly Gly Gly  
85 90 95  
Pro Pro Gly Ala Pro Gly Ala Pro Leu Arg Glu Glu Leu Glu Ser Ala  
100 105 110

Sequence Listing 1998-407-FF-SQ

Phe Gly Gly Val Glu Lys Phe Arg Glu Ala Phe Ala Ala Ala Ala Ala  
115 120 125  
Ala His Phe Gly Ser Gly Trp Ala Trp Leu Cys Phe Cys Lys Lys Ser  
130 135 140  
Arg Ser Leu Phe Leu Leu Gln Thr His Asp Gly Ala Thr Pro Phe Arg  
145 150 155 160  
Asp Asn Pro Asn Cys Ala Pro Leu Leu Thr Cys Asp Leu Trp Glu His  
165 170 175  
Ala Tyr Tyr Ile Asp Arg Arg Asn Asp Arg Lys Ser Tyr Leu Asp Ala  
180 185 190  
Trp Trp Ser Val Val Asn Trp Asp Phe Ala Asn Glu Asn Leu Lys Lys  
195 200 205  
Ala Met Gln Gly Ser Asp  
210

(2) INFORMATION FOR SEQ ID NO: 2:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 13 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Leu Gly Pro Leu Ala Leu Pro Leu Leu Ala Asp Val Arg  
1 5 10

(2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 223 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

Met Pro Leu Asn Leu Gly Asp Ser Phe Pro Asp Phe Gln Ala Glu Ala  
1 5 10 15

# Sequence Listing 1998-407-FF-SQ

Leu Gly Ala Glu His Phe Arg Leu His Glu Tyr Leu Gly Asp Ser Trp  
20 25 30  
Gly Val Met Phe Ser His Pro Asn Asp Phe Thr Pro Val Cys Thr Thr  
35 40 45  
Glu Leu Ala Glu Ala Val Lys Leu Gln Asp Ser Phe Thr Lys Lys Asn  
50 55 60  
Cys Lys Leu Val Gly Phe Ser Cys Asn Asp Leu Gln Ser His Arg Glu  
65 70 75 80  
Trp Ala Lys Asp Ile Met Ala Tyr Ala Gly Arg Ser Gly Asn Leu Pro  
85 90 95  
Phe Pro Leu Val Cys Asp Pro Asn Arg Glu Leu Ala Ala Ser Leu Gly  
100 105 110  
Ile Met Asp Pro Ala Glu Lys Asp Lys Lys Gly Leu Pro Leu Thr Cys  
115 120 125  
Arg Cys Val Phe Phe Ile Ser Pro Glu Lys Lys Leu Ala Ala Ser Ile  
130 135 140  
Leu Tyr Pro Ala Thr Thr Gly Arg Asn Phe Ala Glu Ile Leu Arg Val  
145 150 155 160  
Leu Asp Ser Leu Gln Leu Thr Ala Lys Phe Pro Val Ala Thr Pro Val  
165 170 175  
Asp Trp Thr Ala Gly Ala Lys Cys Cys Val Val Pro Asn Leu Ala Ala  
180 185 190  
Glu Glu Ala Gln Arg Leu Leu Pro Lys Gly His Glu Ala Leu Gln Leu  
195 200 205  
Pro Ser Gly Lys Pro Tyr Leu Arg Leu Thr Pro Asp Pro Arg Gly  
210 215 220

## (2) INFORMATION FOR SEQ ID NO: 4:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 15 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

Met Ser Pro Ser Pro Ala Gly Val Ala Glu Tyr Leu Ala Ser Leu  
1 5 10 15

## (2) INFORMATION FOR SEQ ID NO: 5:

- (i) SEQUENCE CHARACTERISTICS:

Sequence Listing 1998-407-FF-SQ

- (A) LENGTH: 16 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Asn His Ala Glu Phe Asp Pro Ser Gln Thr Glu Val Val Val Phe Pro  
1 5 10 15

(2) INFORMATION FOR SEQ ID NO: 6:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 20 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(v) FRAGMENT TYPE: internal

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Val Asp Ser Phe Thr Pro Ser Val Gly Cys Val Phe Ala Gly Met Pro  
1 5 10 15

Ala Asp Phe Arg  
20

(2) INFORMATION FOR SEQ ID NO: 7:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

GTAAATTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 8:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid

Sequence Listing 1998-407-FF-SQ

- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

GTAAACTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 9:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

GTAAATTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 10:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

GTAAACTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 11:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

GTTAATTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 12:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

GTAACTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 13:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

GTAAATTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 14:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

GTAACTGGG ACTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 15:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

Sequence Listing 1998-407-FF-SQ

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

GTGAATTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

GTGAACTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

GTGAATTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

GTGAACTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

Sequence Listing 1998-407-FF-SQ

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

GTCAATTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 20:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

GTCAACTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 21:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

GTCAATTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 22:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

GTCAACTGGG ACTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 23:



Sequence Listing 1998-407-FF-SQ

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

GTAAATTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 24:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

GTAAACTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 25:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

GTAAATTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 26:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

Sequence Listing 1998-407-FF-SQ

GTAAACTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 27:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

GTTAATTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 28:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

GTAAACTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 29:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

GTTAATTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 30:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

Sequence Listing 1998-407-FF-SQ

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

GTAACTGGG ATTTCGC

17

(2) INFORMATION FOR SEQ ID NO: 31:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

GTGAATTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 32:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

GTGAACTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 33:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

GTGAATTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 34:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

Sequence Listing 1998-407-FF-SQ

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

GTGAACTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 35:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

GTCAATTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 36:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

GTCAACTGGG ATTTTGC

17

(2) INFORMATION FOR SEQ ID NO: 37:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

GTCAATTGGG ATTTTGC

17

# Sequence Listing 1998-407-FF-SQ

## (2) INFORMATION FOR SEQ ID NO: 38:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

GTCAACTGGG ATTTTGC

17

## (2) INFORMATION FOR SEQ ID NO: 39:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 719 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

atg ccg ttc gaa ctc ccc ccg ctg ccg tac ccc atg gac gcc ctc gag	48
Met Pro Phe Glu Leu Pro Pro Leu Pro Tyr Pro Met Asp Ala Leu Glu	
1 5 10 15	
ccg tac atc agc aaa gag act ctc gag tac cac tat ggg aag cac cac	96
Pro Tyr Ile Ser Lys Glu Thr Leu Glu Tyr His Tyr Gly Lys His His	
20 25 30	
gcg gct tac gtg aac aac ttg aac aga ctc gtc gag ggg aag ccg gag	144
Ala Ala Tyr Val Asn Asn Leu Asn Arg Leu Val Glu Gly Lys Pro Glu	
35 40 45	
gct tcc aag agc ctg gag gaa ata ata aag acc tcc tcg ggg tcg gtg	192
Ala Ser Lys Ser Leu Glu Glu Ile Ile Lys Thr Ser Ser Gly Ser Val	
50 55 60	
ctg aac aac gcg ggc cag gcg tgg aac cac acg ttc tac tgg aag tcg	240
Leu Asn Asn Ala Gly Gln Ala Trp Asn His Thr Phe Tyr Trp Lys Ser	
65 70 75 80	
atg cgg ccg gcc tcg gcg ggg ggc ccc ccg ggg gcc ccc ggc ggg ggc	288
Met Arg Pro Ala Ser Ala Gly Gly Pro Pro Gly Ala Pro Gly Gly Gly	
85 90 95	
ccc ccg ggg gcc ccg ggg gcc ccc ctg ccg gag gag ctg gag agc gcg	336
Pro Pro Gly Ala Pro Gly Ala Pro Leu Arg Glu Glu Leu Glu Ser Ala	
100 105 110	
ttc ggg ggc gtg gag aag ttc cgg gag gcc ttt gct gct gct gct gct	384
Phe Gly Gly Val Glu Lys Phe Arg Glu Ala Phe Ala Ala Ala Ala Ala	

Sequence Listing 1998-407-FF-SQ

115	120	125	
gcg cac ttc ggc tcg ggc tgg gcc tgg ctc tgc ttc tgc aag aag tcc Ala His Phe Gly Ser Gly Trp Ala Trp Leu Cys Phe Cys Lys Lys Ser	130	135	140 432
cgc agc ctc ttt ttg ctg cag acc cac gac ggg gcc acg cct ttc aga Arg Ser Leu Phe Leu Leu Gln Thr His Asp Gly Ala Thr Pro Phe Arg	145	150	155 160 480
gac aac ccc aac tgc gcg ccg ctg ctc acc tgc gac ctg tgg gag cac Asp Asn Pro Asn Cys Ala Pro Leu Leu Thr Cys Asp Leu Trp Glu His	165	170	175 528
gcc tac tac atc gac cgc aga aac gac cgc aag agc tac ctc gac gcg Ala Tyr Tyr Ile Asp Arg Arg Asn Asp Arg Lys Ser Tyr Leu Asp Ala	180	185	190 576
tgg tgg tct gtg gtg aat tgg gac ttc gcg aac gag aac ttg aag aag Trp Trp Ser Val Val Asn Trp Asp Phe Ala Asn Glu Asn Leu Lys Lys	195	200	205 624
gca atg cag gga agc gac tag gcgcgtggtg gtctgtggtg aattgggact Ala Met Gln Gly Ser Asp	210	215	675
tcgcgaacga gaacttgaag aaggcaatgc agggaagcga ctag			719

(2) INFORMATION FOR SEQ ID NO: 40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 265 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

TTCCCGGATT TTCAGGCGGA GGCGCTGGGC GCCGAGCACT TCCGCTTGCA CGAGTACTTG	60
GGGGACAGCT GGGGAGTGAT GTTCAGGTAA GATTGGCGTA AAAAAGCCCC ATTTAATCGC	120
ATTTTAAATT CTGTAGACTC TGTGTCGACT GCTGAGCACG AGGGGGGGGC CTGCTGCACG	180
GGAGAGCCTT GTCTCGCGCT CAACTCTGGG TTTCTGGCGT TGCTTGACAG CACCCGAACG	240
ACTTCACCCC CGTCTGCACC ACCGA	265

(2) INFORMATION FOR SEQ ID NO: 41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 672 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## Sequence Listing 1998-407-FF-SQ

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

atg	ccg	ttg	aac	ttg	gga	gat	tcc	ttt	cca	gac	ttc	cag	gcg	gag	gcg	48
Met	Pro	Leu	Asn	Leu	Gly	Asp	Ser	Phe	Pro	Asp	Phe	Gln	Ala	Glu	Ala	
1				5					10					15		
ctg	ggc	gcc	gag	cac	ttc	cgc	ttg	cac	gag	tac	ttg	ggg	gac	agc	tgg	96
Leu	Gly	Ala	Glu	His	Phe	Arg	Leu	His	Glu	Tyr	Leu	Gly	Asp	Ser	Trp	
			20					25					30			
gga	gtg	atg	ttc	agc	cac	ccg	aac	gac	ttc	act	ccc	gtt	tgc	aca	acg	144
Gly	Val	Met	Phe	Ser	His	Pro	Asn	Asp	Phe	Thr	Pro	Val	Cys	Thr	Thr	
		35					40					45				
gag	ctc	gcc	gaa	gcc	gtg	aag	ctc	cag	gac	tcc	ttc	acg	aag	aag	aac	192
Glu	Leu	Ala	Glu	Ala	Val	Lys	Leu	Gln	Asp	Ser	Phe	Thr	Lys	Lys	Asn	
	50					55					60					
tgc	aaa	ctc	gtt	ggc	ttc	tcc	tgc	aac	gac	ctg	cag	agc	cac	aga	gaa	240
Cys	Lys	Leu	Val	Gly	Phe	Ser	Cys	Asn	Asp	Leu	Gln	Ser	His	Arg	Glu	
65				70						75					80	
tgg	gcg	aag	gat	ata	atg	gcc	tat	gca	ggc	cga	tct	ggg	aac	ttg	ccg	288
Trp	Ala	Lys	Asp	Ile	Met	Ala	Tyr	Ala	Gly	Arg	Ser	Gly	Asn	Leu	Pro	
				85					90					95		
ttt	ccc	ctc	gtt	tgc	gac	ccc	aat	agg	gaa	ctg	gcc	gcg	agt	ttg	gga	336
Phe	Pro	Leu	Val	Cys	Asp	Pro	Asn	Arg	Glu	Leu	Ala	Ala	Ser	Leu	Gly	
			100					105					110			
att	atg	gat	cct	gca	gaa	aag	gac	aaa	aag	ggg	ctg	cct	ttg	act	tgc	384
Ile	Met	Asp	Pro	Ala	Glu	Lys	Asp	Lys	Lys	Gly	Leu	Pro	Leu	Thr	Cys	
		115					120					125				
cgc	tgc	gtc	ttt	ttc	ata	agt	cca	gag	aag	aag	ctc	gcg	gcc	tct	att	432
Arg	Cys	Val	Phe	Phe	Ile	Ser	Pro	Glu	Lys	Lys	Leu	Ala	Ala	Ser	Ile	
	130					135					140					
ttg	tac	ccg	gct	acc	acc	ggg	aga	aac	ttc	gcg	gaa	atc	ctt	agg	gtc	480
Leu	Tyr	Pro	Ala	Thr	Thr	Gly	Arg	Asn	Phe	Ala	Glu	Ile	Leu	Arg	Val	
145					150					155					160	
ctg	gac	tct	ctg	cag	ctc	act	gcc	aag	ttt	cca	gtg	gcc	act	cca	gtg	528
Leu	Asp	Ser	Leu	Gln	Leu	Thr	Ala	Lys	Phe	Pro	Val	Ala	Thr	Pro	Val	
				165					170					175		
gac	tgg	acc	gct	ggg	gcc	aaa	tgc	tgc	gta	gtg	ccg	aac	ttg	gca	gca	576
Asp	Trp	Thr	Ala	Gly	Ala	Lys	Cys	Cys	Val	Val	Pro	Asn	Leu	Ala	Ala	
			180					185					190			
gaa	gag	gcc	caa	agg	ctt	ttg	ccc	aaa	ggc	cac	gag	gcg	ctg	cag	ctg	624
Glu	Glu	Ala	Gln	Arg	Leu	Leu	Pro	Lys	Gly	His	Glu	Ala	Leu	Gln	Leu	
		195					200					205				
cct	tcg	ggg	aag	cct	tac	ctg	cgg	ctc	acc	cca	gac	ccc	agg	ggc	tga	672
Pro	Ser	Gly	Lys	Pro	Tyr	Leu	Arg	Leu	Thr	Pro	Asp	Pro	Arg	Gly		
	210					215					220					